



January 16, 2009

Ms. Carole Davis
Co-Executive Secretary of the Dietary Guidelines Advisory Committee
Center for Nutrition Policy and Promotion
U.S. Department of Agriculture
301 Park Center Drive, Room 1034
Alexandria, VA 22302

Dear Ms Davis:

The Sugar Association, Inc., (Association) is pleased to offer these comments to the 2010 Dietary Guidelines Advisory Committee (DGAC) for its consideration. The Association represents United States sugar cane growers and refiners and sugar beet growers and processors. Association members account for over 90% of sugar production in the United States. Founded in 1943, our mission is to monitor nutrition science, to educate consumers about sugar's role in a healthy diet and active lifestyle and to ensure all Federal nutrition policy regarding sugar is based on the preponderance of scientific evidence. Based on the totality of scientific evidence, we support and promote sugar in moderation as a safe and useful part of a balanced diet and healthful lifestyle.

The Association and its members acknowledge and share the health and nutrition communities' concern about the increasing number of American adults and children who are overweight and obese. We would like to thank the newly formed DGAC for agreeing to serve during this time of great challenge.

The Association supports current efforts to advise the American public that fruits, vegetables, whole grain and other fiber-rich and calcium-rich foods should be the centerpieces of their daily diets. We also believe that it is important for Americans to understand that any food, not just sweet foods and beverages, that don't contribute appreciable nutrients, should not be major components of a diet but should be consumed as treats.

We contend that dietary advice that leads Americans to believe that food is less healthy just because it contains sugar, regardless of the total nutrient contributions of the food, is misleading and not science based. Current dietary advice that states sugars supply

calories but few or no nutrients is misleading because people don't consume sugars in isolation but consume foods and beverages that contain sugars, many of which are healthful foods. Clearly the important consideration for healthy eating is not the sugars content of a food but the nutrient contribution of that food and the healthfulness of the entire diet, within caloric needs.

Therefore, the Association is pleased to offer the following science and perspective on issues relating to sugar intake for the Committee's consideration:

Major scientific reviews of the scientific literature on sugars intake

Sugars have been a part of the human diet for over 2,000 years, with their impact on health intensely studied for the past century. All comprehensive reviews of the body of the scientific literature conclude that, with the exception of dental caries, no causal link can be established between the intake of sugars and lifestyle diseases.

Sugars intake became such a polarizing topic during the 2000 Dietary Guidelines for Americans debate and it was widely recommended that the National Academy of Sciences (NAS) conduct an independent, comprehensive scientific review of the health implications of sugars consumption. The Sugar Association publicly stated its support of this recommendation. Following its extensive review of the scientific literature, the NAS, Institute of Medicine "Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein and Amino Acids" (IOM report) panel concluded in 2002:

Based on the data available on dental caries, behavior, cancer, risk of obesity, and risk of hyperlipidemia, there is insufficient evidence to set a UL (upper level) for total or added sugars.¹

The NAS report also stated unequivocally: "There is *no* clear and consistent association between *increased intakes of added sugars* and BMI."² (Emphasis added) It is important to note that per capita consumption of total sugars intake has steadily decreased since 1999.³

Furthermore, identical conclusions on sugars and health have been reached following every previous comprehensive review of the scientific literature.

- In 1986, the FDA Sugars Task Force, reviewed more than 1000 scientific papers, and reported that, "[o]ther than the contribution to dental caries, there

¹ Food & Nutrition Bd., Nat'l Acad. of Sciences, Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids (Macronutrients) 6-42 (2002) [hereinafter Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids (Macronutrients)]

² Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids (Macronutrients), *supra* note 5, at 6-37 (emphasis added).

³ USDA ERS, Sugar and Sweeteners Yearbook Tables found at <http://www.ers.usda.gov/Briefing/Sugar/data.htm>

is no conclusive evidence that demonstrates a hazard to the general public when sugars are consumed at the levels that are now current and in the manner now practiced.”⁴

- The 1989 National Academy of Sciences Report on Diet and Health stated: “Sugar consumption (by those with an adequate diet) has not been established as a risk factor for any chronic disease other than dental caries in humans.”⁵
- In 1997, a joint FAO/WHO report concurred that “there is no evidence of direct involvement of sucrose, other sugars and starch in the etiology of lifestyle diseases.”⁶

Science has never established a public health need to set an intake level for sugars.

The fact that no authoritative scientific body has ever set an Upper Intake Level for sugars based on existing diet and health studies clearly denotes that dietary sugars per-se are relatively benign and pose no direct negative health impact. It is important to highlight the following criteria for setting a UL.

Tolerable Upper Intake Level (UL): the highest average daily nutrient intake level that is likely to pose no risk of adverse health effects to almost all individuals in the general population. As intake increases above the UL, the potential risk of adverse effects may increase. (Emphasis added)

The IOM did not make a recommendation for sugars intake nor did it find scientific justification for setting an Upper Level. The IOM report states,

“Although a UL is not set for sugars, a maximal intake level of 25 percent or less of energy from added sugars is suggested based on the decreased intake of some micronutrients of American subpopulations exceeding this level.”⁷ (Emphasis added)

The Association recognizes that the 25% intake level is not a consumption recommendation but a benchmark where the nutrient adequacy of the diet might become an issue. But, the IOM panel did not conclude that sugars intake is causing nutrient dilution in the general population.

⁴ Walter H. Glinsmann, et al., *Evaluation of Health Aspects of Sugars Contained In Carbohydrate Sweeteners*, 116 J. Nutrition SI, S15 (Supp. 11 1986).

⁵ Comm. on Diet and Health, Nat’l Research Council, *Diet and Health: Implications of Reducing Chronic Disease Risk* 1-11 (1989).

⁶ World Health Organization & Food and Agric. Org. of the United Nations, *FAO Food and Nutrition Paper 66, Carbohydrates In Human Nutrition: Report of a Joint FAO/WHO Consultation* 36 (1998)

⁷ Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids (Macronutrients), *supra* note 5, at 6-42 (emphasis added).

Furthermore, the average American does not consume 25% of energy from sugars.⁸ A consistent measure of per capita consumption trends is the USDA “Nutrient Content of the U. S. Food Supply” data. Per capita consumption data based solely on marketplace availability is known to be high due to waste and other losses. Yet this dataset shows that sugars intake as a percent of energy has remained relatively consistent fluctuating between 17% and 19% (respectively) between 1970 and 2005.⁹

The inverse relationship between fat and sugars consumption (Sugar/Fat Seesaw)

Encouraging Americans to reduce fat or sugar intake has not worked as was demonstrated by the low-fat decade of the 1990s. We believe that the emphasis should be on individuals reducing their overall food and beverage intake (calories).

Simply reducing fat or sugars in the diet is counterproductive if a reduction in total caloric intake is not achieved. There is a plausible argument that past dietary advice that put emphasis on reducing individual macronutrients (fats and sugars) instead of emphasizing how important it is for individuals to consume food and beverages within their caloric needs has been counterproductive in helping Americans achieve healthful diets and healthy weights. Low-fat and sugar-free products are in most cases not calorie-free.

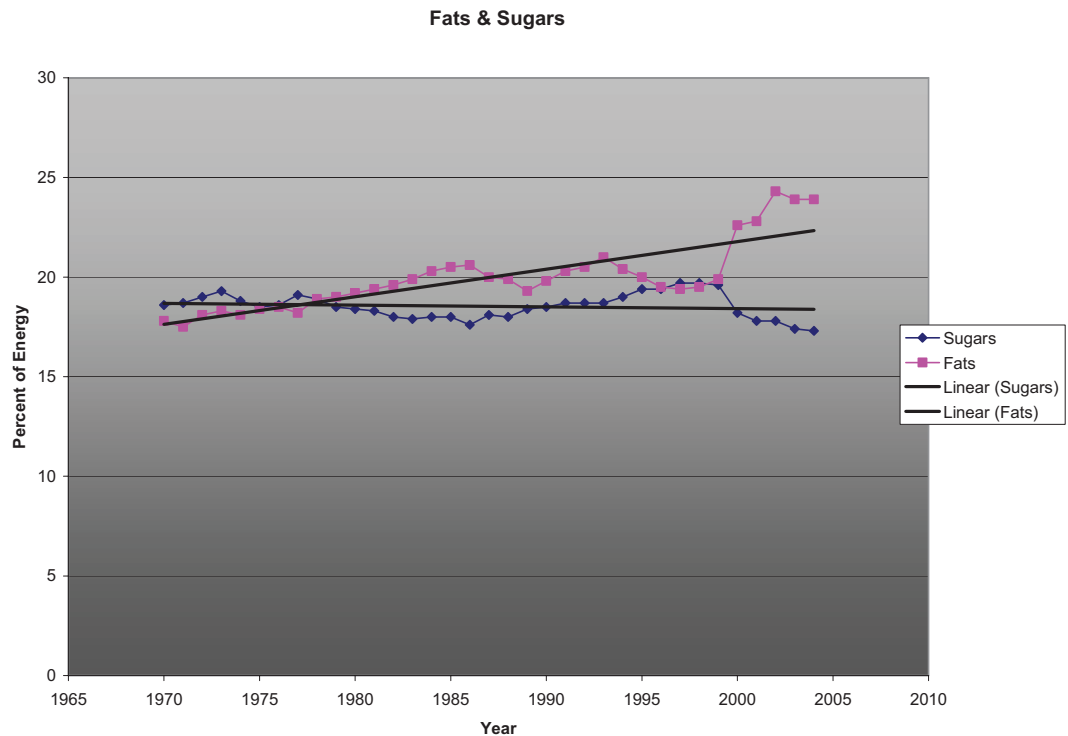
Furthermore, the current focus on reducing sugars in the diet will only exacerbate the troubling growth in fat consumption in the United States. Scientific studies have documented the inverse relationship between fat and sugars intake when expressed as percent of energy in both the United States and the European Union.¹⁰ Concerns over the inverse fat-sugar relationship in the diet prompted the 2002 NAS panel to recommend research “to determine whether there is a metabolic effect of sugars in enhancing energy expenditure and/or in suppressing fat intake at a fixed level of energy.”¹¹

⁸ What We Eat in America, NHANES 2003-2004, U.S. department of Agriculture, Agricultural Research Service, 2007. Nutrient intakes from food: mean amounts consumed per individual, one day, 2003 – 2004. Available at www.ars.usda.gov/ba/bhnrc/fsrg.

⁹ USDA, CNPP, Nutrient Content of the U.S. Food Supply, 2005, Home Economics Research Report No. 58, 6 Table 4

¹⁰ M. Gibney et al., *Consumption of Sugars*, 62 Am. J. Clinical Nutrition 178S (Supp. 1995). This relationship was reflected in a more recent study that examined the impact of low fat interventions in school lunches—it was noted that “[a]s percent of calories from fat or saturated fat in lunches decreased, that from sugars increased.” J.T. Dwyer et al., *Fat-Sugar See-Saw in School Lunches: Impact of a Low Fat Intervention*, 32 J. Adolescent Health 428 (Supp. 6 2003) R.P. Farris, *Nutrient Intake and Food Group Consumption of 10-Year-Olds by Sugar Intake Level: The Bogalusa Heart Study*, 17 J. Am. College Nutr. 579 (1998) ;J.O. Hill and A.M. Prentice, *Sugar and Body Weight Regulation*, 62 Am. J. Clin. Nutr. 262S (Supp. 1995).

¹¹ Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids (Macronutrients), *supra* note 5, at 6-42.



USDA “Nutrient Content of the U. S. Food Supply” data provides per capita consumption trends based on marketplace availability. This dataset shows the inverse relationship between fat and sugar intake. The 2005 data are even more disturbing with unprecedented intakes in both total calories and grams of fat. The 2005 per capita energy intakes was 4,000 calories per day and fat increased to 190 grams per person per day.

These trend data show that there has been a steady decline in the percent of energy from total sugars since 1999. For a decline in sugars consumption to be meaningful there would need to be a corresponding decline in fat consumption instead of the inverse as shown in the figure above.

In the final analysis, emphasis on reducing the intake of individual macronutrients, in particular fats and sugars, over reducing total energy intake may have exacerbated the problem.

Sugars and fats are essential components of foods. It is reasonable to expect that should a decline in per capita total energy be achieved, this would lead to a corresponding, meaningful, decline in per capita consumption of both fats and sugars.

Sugars Intake and Diet Quality

Although there have been questions raised regarding the possibility that sugars may displace certain nutrients in the diets of certain American subpopulations, a

unilateral relationship is not established and the interrelated nature of macronutrient and micronutrient consumption is complex.

Historic, as well as, recent analyses regarding the impact of sugar intake does not consistently find a direct inverse association between micronutrient intake and sugars contents because sugars make many healthy foods palatable, which is a positive factor in the intake levels of many essential micronutrients.^{12 13 14 15 16 17 18} Nutrition adequacy is determined by the totality of one's diet.

Furthermore, the majority of current science that address the issues of nutrient adequacy and weight control primarily focus on issues relating to the consumption of soft drinks, which reportedly contributes one third of all the sugars added to foods and beverages.¹⁹ The concern about increased consumption of one category of intake, whether warranted or not, should be addressed as an independent issue and not be used as the basis for providing dietary advice on an entire class of ingredients.

Discretionary Calories

While certain foods could be considered "discretionary foods" depending on an individual's energy needs, the concept of discretionary calories is impractical because people don't eat individual nutrients or calories, they eat food. Designating added sugars as discretionary calories does not help average consumers make informed food choices and may direct them to foods that have fewer sugars but not fewer calories. For example, a candy bar may have fewer grams of sugar than a nutrient-rich yogurt.

The Pyramid model used to set discretionary calories is based solely on mathematical calculations designed to assure nutrient adequacy without exceeding caloric intake restrictions. This mathematical model inflates the number of servings of certain food items to reach high micronutrient thresholds and designates certain components of foods and the diet as left over or discretionary calories.

¹² Rennie KL et al "Association between added sugar intake and micronutrient intake: a systematic review" *British Journal of Nutrition* 2007; 97: 832-841

¹³ Op cit 6

¹⁴ Frary CD et al "Children and Adolescents' Choices of Foods and Beverages High in Added Sugars Are Association with Intakes of Key Nutrients and Food Groups", *Journal of Adolescent Health* 2004; 34: 56-63

¹⁵ Murphy MM et al "Drinking flavored or plain milk is positively association with nutrient intake and is not associated with adverse effects on weight status in US children and adolescents" *J Am Diet Assoc*, 2008 Apr; 108(4):631-9

¹⁶ RA Forshee, ML Storey, Controversy and statistical issues in the use of nutrient densities in assessing diet quality. *Journal of Nutrition*, 2004 134(10): 2733-2737

¹⁷ SA Gibson, Dietary sugars intake and micronutrient adequacy: a systematic review of the evidence. *Nutrition Research Review*, 2007 20(2): 121-131

¹⁸ Op cit 1

¹⁹ JF Guthrie, JF Morton Food sources of added sweeteners in the diets of Americans, *Journal of the American Dietetic Association* 100:43-48, 2000

Furthermore, the Pyramid model lacks the scientific underpinning to be used as the basis for official or unofficial quantitative recommendations for levels of sugars intake. This is also the conclusion of the American Dietetic Association (ADA) in its revised position paper on nutritive and non-nutritive sweeteners. After providing a detailed description of the construct of the Pyramid, ADA concluded, “Thus, the suggestion of 6% to 10% of energy from added sugars was not based on any scientific evidence regarding health impacts (Emphasis added) but was calculated using the Food Guide Pyramid.”²⁰

To eat within the discretionary calorie limit set for sugars intake would require the assumption that sugars are an expendable ingredient in all foods. In order to meet this stringent advice for sugars intake, one would have to almost exclusively consume many nutrient-rich foods sweetened with artificial sweeteners. This could have unforeseen consequences for satiety and metabolism and lead to a preference for increased high intensity sweetness, especially for children, that can be achieved only with artificial sweeteners.

As stated in the recent Institute of Medicine report *Nutrition Standards for Foods in Schools*, “While available studies of the safety of nonnutritive sweeteners have given assurance that they can be marketed and consumed by the public, there are not any studies that have looked for potential effects when these substances are consumed over many years, starting in childhood or teen years. (Emphasis added) Therefore, the committee did not make recommendations regarding foods containing nonnutritive sweeteners.”

Furthermore, emerging science is questioning the efficacy of artificial sweeteners in weight loss.^{21 22 23 24 25} Until there is more scientific investigation into the consequences of replacing sugar with artificial ingredients on metabolism and satiety, we may be encouraging the use of chemicals to replace natural ingredients, without a clear understanding of future impacts.

Dietary guidance based on achieving nutrient adequacy

The Association acknowledges that nutrient adequacy is the fundamental goal of nutrition advice and appreciates that this objective is an important consideration for the

²⁰ Position of the American Dietetic Association: Use of Nutrition and Nonnutritive Sweeteners, “Journal of the American Dietetic Association,” Feb. 2004 p. 255-275
http://www.eatright.org/Public/Other/index_adap0598.cfm

²¹ SE Swithers, TL Davidson. A role for sweet taste: Calorie predictive relations in energy regulation by rats. *Behavioral Neuroscience*, published online February 11, 2008 (DOI: 10.1037/0735-7044.00.0.000) by the American Psychological Association

²² TL Davidson, SE Swithers. A Pavlovian approach to the problem of obesity. *International Journal of Obesity* (2004), **28**: 933 – 935

²³ SP Fowler, K Williams, RG Resendez, et al. Fueling the obesity epidemic? Artificially sweetened beverage use and long-term weight gain. *Obesity* (2008) **16**: 1894 – 1900.

²⁴ ZB Andrews, TL Horvath. Tasteless food reward. *Neuron* (2008) **57**: 806 – 808.

²⁵ IE de Araujo, AJ Oliveira-Maia, TD Sotnikova, et al. Food reward in the absence of taste receptor signaling. *Neuron* (2008) **57**: 930 – 941.

DGAC. Yet achieving overly prescriptive dietary eating patterns, such as the Pyramid construct, does not allow the average American realistic flexibility and may not be necessary to assure a nutrient adequate diet.

In a 2003 review article, Dr. Cutberto Garza wrote the following about the process used in the development of the revised dietary reference intakes.²⁶

“It was clear that scientific, healthcare practitioners and consumer communities had moved beyond focused interest in the prevention of classical nutrient deficiencies.”

“Related to this consideration was an appreciation of the unprecedented ability to manipulate nutrient intakes over wide ranges by increasingly common voluntary fortification of foods, increasing and expanding uses of nutrient supplements and nutrient-related botanicals, and the growing likelihood of expanded capabilities to alter the nutritional characteristics of food crops and animals by genetic modification. These on-going and anticipated changes in food supply raised concerns regarding the evidence base justifying the putative benefits of intake levels higher than necessary to prevent classical deficiency diseases and to possibilities of more easily reaching toxic levels of nutrients in diets easily accessible to the public.” (Emphasis Added)

The Association respectfully points out that US recommended nutrient intakes are established on the basis of meeting the nutrition needs of 98% of the population.²⁷ In any short-term dietary sampling, whose information is used as the foundation of food guidance, it is highly unusual if all micronutrient intakes to equal their recommended levels. The Association respectfully reminds the DGAC that the predisposition “to err on the side of generosity”²⁷ essentially means micronutrient intakes exceeding 67% of recommended amounts result in nutrient adequate diets.

Again, we would like to emphasize our support for efforts to advise the American public that fruits, vegetables, whole grain and other fiber-rich and calcium-rich foods should be the centerpieces of their daily diets. We also believe that it is important for Americans to understand that sweet foods and beverages that don’t contribute nutrients should not be major components of a diet but should be consumed as treats.

But at a time when increasing overweight and obesity is the most urgent public health concern we would like to propose for the Committee’s consideration that food guidance that seeks to insure 100% nutrient adequate diets using recommended serving amounts may be confusing to a population that generally needs to eat less.

²⁶ Cutberto Garza, M.D., Ph.D., Moving Beyond the RDA’s to Dietary Reference Intakes(DRIs)
<http://www.cce.cornell.edu/food/expfiles/topics/garza/garzaoverview.html>

²⁷ National Research Council, Food and Nutrition Board. Recommended Dietary Allowances, 10th edition. National Academy Press, Washington DC, 1989.

Sugars –Replacement Ingredients

Consumers who select foods based on a reduction in grams of sugars listed in the Nutrition Facts Panel are often being misled. Sugars are frequently replaced by carbohydrate bulking agents, such as glycerol or maltodextrins, and/or by an increase in fat content to maintain functionality and/or taste. These sugar replacers provide no nutritional benefit or a significant caloric reduction over sugars

Academic institutions²⁸ and the media²⁹ have expressed unease about the misleading nature of reduced sugar foods. The unavoidable conclusion is that many reduced sugar foods not only fail to assist consumers in planning healthful diets, but actually deceive consumers into purchasing products that are not reduced in calories, and are sometimes higher in both calories and fat, than the original products.

The Glycemic Index

Even if glycemic response as measured by the glycemic index were to be deemed relevant for healthful food choices, it would not suggest greater concern over sugar or sugars than over other digestible carbohydrates.

As indicated in the International Table of Glycemic Index,³⁰ potatoes, white bread, wheat bread, and carrots have a higher glycemic index than sugars other than dextrose/glucose.

The premise behind low glycemic index food choices, which is to encourage the consumption of whole grains and fiber rich foods, is good dietary advice. The fallacy of asking the general public to evaluate carbohydrate quality based on the glycemic index is that glycemic response can be affected by factors such as accompanying fat and/or protein content.^{31 32} The theory behind glycemic index diets fails to recognize that foods

²⁸ A recent issue of the Tufts University “Health & Nutrition Letter” points out that sugar-free cookies have a similar number of grams of carbohydrates and calories as sugar-containing cookies. *Sugar-Free Shortcomings*, Health & Nutrition Letter (Tufts Univ., Medford, MA), June 2003, at 1 (Tab 15).

²⁹ *Lower-Sugar Foods: Some are Diet Traps*, Consumer Reports, Feb. 2005, at 49; Bonnie S. Benwicj, *Are Reduced-Sugar Cereals Worth It?*, Wash. Post, Feb. 23, 2005, at F1; Bonnie S. Benwick, *How Big Is Your Cereal Bowl?*, Wash. Post, Feb. 23, 2005, at F2; ABC News, *Experts Question Reduced-Sugar Cereals* (Mar. 22, 2005), available at http://abclocal.go.com/kabc/health/032205_hs_reduced_sugar_cereals.html (Tab 16).

³⁰ Kaye Foster Powell et al., *International Table of Glycemic Index and Glycemic Load Values: 2002*, 76 Am. J. Clinical Nutrition 5, 14-15, 95, tbl. 1 (2002), available at <http://www.ajcn.org/cgi/content/full/76/1/5#SEC4>

³¹ S Vega-Lopez, LM Ausman, JL Griffith, A Lichtenstein. Interindividual variability and intra-individual reproducibility of glycemic index values for commercial white bread. *Diabetes Care* 2007; 30(6): 1412-1417.

³² LM Aston, JM Gambell, DM Lee et al. Determination of the glycemic index of various staple carbohydrate-rich foods in the UK diet. *European Journal of Clinical Nutrition* 2008; 62(2): 279-285.

are not eaten in isolation. In fact, the glycemic index of a food can be lowered by simply adding fat to it.

The Association respectfully asks that the DGAC continue to provide the American consumer with sound nutrition advice on the importance of fruits, vegetables, whole grains, fiber-rich foods and reduced-fat dairy and to not further confuse Americans with advice that sanctions glycemic index or load when making food choices.

Summary

- People eat foods, not individual nutrients.
- Sugar is valued as a food ingredient not only for its flavor enhancement but also for its uniqueness to meet the myriad of fundamental and essential functional requirements.
- There is no scientifically verifiable negative health impact ascribable to sugar intake, including obesity and nutrient displacement, at current consumption levels.
- Every major scientific review completely exonerates the direct involvement of sugars in the etiology of lifestyle diseases.
- The IOM Report did not set a UL for total or added sugars intake, only a suggested threshold for added sugars.
- The suggested intake threshold is well above the current average consumption level of sugars in the US population.
- Authoritative scientific bodies including the US Food and Drug Administration conclude that “added” and “naturally occurring” sugars are indistinguishable and therefore consumers could be misled into believing that food containing no refined sugar is superior to food containing refined sugar.
- Inordinate emphasis on added sugars could create a public health outcome similar to the one resulting from the simplistic focus on low-fat. The importance of energy balance is obscured by these one-dimensional approaches.
- We ask the DGAC consider the potential long-term repercussions the current trend to reformulate foods using sugar replacers may have on satiety, metabolism and taste preference, especially among children.

The Association would like to thank the DGAC for its consideration of these comments.

Respectfully,
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